





POPULAR OPTIONS

Additional Labeling

- Custom Silkscreening
- Bar Codes



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Model PDA2-LS Power Distribution System



GENERAL OVERVIEW

Jasper Electronics Model PDA2-LS Power Distribution System is **fully compliant** with the State of California Department of Transportation (CalTrans) Transportation Electrical Equipment Specification (TEES) November 05, 2020. The compact TEES Model PDA2-LS Power Distribution System is responsible for AC power intake and AC and DC power distribution to circuits within the traffic signal control cabinet. It is identical in function and control to the PDA-2L originally defined in TEES 2009, but with the overall height reduced by 1.75" [4.445cm] to 5.25" [13.335cm,] allowing space for the addition of a drawer shelf for laptop support in 336LS and 346LX cabinets.

Three AC circuits sourced from the Service Panel Assembly provide power to the PDA2-LS. Each is terminated at a 15 Amp circuit breaker. "AC+ Equip" powers a NEMA type 5-15R GFCI duplex receptacle accessible on the front panel, and a type 5-15R non-GFCI receptacle labeled "ER2," located on the rear panel. "+AC RAW" powers most of the circuitry within and connected to the PDA2-LS. "+AC CLEAN" passes AC thru an EDCO Model SHA-1250 ITS (or equal) surge protector and EMI filter. This circuit powers the 206LS power supply, the external input file, and a NEMA type 5-15R duplex "Controller Unit Receptacle" labeled "CR" accessible on the rear panel.

In addition, the PDA2-LS has 2 user accessible slots for installing two Model 204 Flasher Units that provide four alternating signal drives. Power is controlled by a two pole 20 Amp circuit breaker on the front panel. Six 10 Amp signal circuit breakers are wired to terminal blocks inside the rear cover, which in turn are wired to the external Output File Assembly.

The PDA2-LS incorporates a user replaceable Jasper Model 206LS power supply, a compact version of our proven model TC206L, as listed on the California DOT Qualified Products List. The 206LS switching power supply is capable of delivering up to 120 Watts of DC power through a single, regulated +24V DC output to provide power for the external (to the PDA) Input and Output Files.







TC206LS GENERAL SPECIFICATIONS

INPUT	
Voltage/ Current Label Rating	AC 90-250V, 47-63Hz, 1.6A max, Single Phase;
TEES Minimum	AC 90-132V, 57-63Hz, 1.6A max
Power Factor	>0.98 line PFC typical at AC 115V, full load
Fusing	AC 3.15A, 250V delayed (slow-blow) action 5x20mm AG cartridge type external line fuse provided, operator accessible. Fuse IEC 60127 certified.
Inrush Current	Soft start (~25oC cold start) 30Apk @ AC 115V
Efficiency	At AC 115V: >75% @ 1.0A; >84% @ 2.5A; > 86% @ 5.0A
	>80% @ 5.0A
Voltage/Current (V/A)	V/1
Model TC206LS	24.01/ 5.04
	Total loading not to exceed 120 Watts at 740C
Output Voltage Setpoint	Eactory preset within +2.0% of nominal voltage
	<+2.0% at the output connection over the full AC input range and $0 = 100%$ output loading
Output Turn-on Delay	<200mSec from AC turn-on
Over/Under Shoot	None at turn-on or turn-off
Stability	$<\pm 0.2\%$ output drift after 20 minute warm-up
Temperature Coefficient	$<\pm0.02\%/\circ$ C,0°-50°C,after 20 minute warm-up
Dynamic Response	<±5.0% deviation with a 50% load change at a slew rate of 1A/µsec. Output recovers to within 5% in less than 300µsec
Ripple and Noise (PARD)	2.0V max peak-to-peak / 500mV RMS nominal at the output terminal with a 20 MHz bandwidth limit. May be measured with a 0.1μ F ceramic capacitor in parallel with a 22μ F tantalum capacitor connected between the measured output and its return
Over Voltage Protection (OVP)	Non-crowbar type from 27.6V to 32.4V
Over Current/ Short Circuit Protection	Protected against overload from 6A to 8A and short-circuit faults. Automatic recovery when overload removed
Over Temperature Protection	Internal temperature sensing. Causes output to shut down. Automatic recovery
Output Transient Protection	Minimum 1400W voltage transient suppressor provided
Output Fusing	AC 8.0A, 250V delayed (slow-blow) action 5x20 AG cartridge type external fuse provided in the (+) output, operator accessible. Fuse IEC 60127 certified
SIGNALS, INDICATORS AND CONT	TROLS
AC Power Indicator	Front panel mounted, single-color LED. Red indicates AC power ON. Off indicates an input fault
DC Power Indicator	Front panel mounted, single-color LED. Green indicates DC power ON. Off indicates an output fault
Output Test Points	Two "banana jack" type test sockets provided on the front panel, color coded red and black. Allows operator to verify output voltage
MECHANICAL	
(Refer to JE Outline Configuration Dw	g, P/N 03751-000.)
Mounting Orientation	Designed for vertical insertion into a TEES speci-fied Power Distribution Assembly PDA #2LS
Weight	1.25Kg [2.75lbs]
Retaining Fastener	A single operator accessible 10-32 UNC captive panel fastener is provided on the front panel. PEM PF11-032-1
OPERATING ENVIRONMENT	
Operating Temperature	-34.6º – +165.2ºF (-37.0º – +74.0ºC) ambient at full load
Cooling	Convection only

*Specifications subject to change without notice.





Relative Humidity	Up to 95% RH, non-condensing	
Operational Vibration	0.75G peak, 5 – 500Hz along three orthogonal axis	
Storage Temperature	-40° to +185°F (-40° to +85°C)	
Altitude	Operating to 10,000 ft. Storage to 30,000 ft	
MTBF	Designed for 150,000 hrs at 25°C	
INTERCONNECT		
Input/ Output Connector	6-circuit (2x3) panel-to-panel plug with 0.250"[6.35mm]x0.055"[1.40mm] blade type contact terminals, rated 15A/pin. General purpose black phenolic insulator material. Secured in the unit rear panel. Cinch model P-2406H-SB. Mates with Cinch model S-2406-SB or equivalent.	
Note: Use of the specified mating connector is required to insure proper current capacity.		
Pin #	Function	
7	+V1 (+24VDC) Output	
8	DC Ground	
9	Earth Ground	
10	No Connection	
11	N – Neutral (ACC) Input	
12	L – Line (AC) Input	
Note: Pin number assignments per CalTrans spec TEES 2009.		
SAFETY, REGULATORY AND EMC		
Designed to comply with the relevant industry standards of the authorities having jurisdiction, typically UL 60950-1, CSA 22.2 and IEC 60950.		
EMI Filtering	Meets CISPR22B Level B, EN55022 Level B, and FCC Part 15, Level B, for conducted emissions	
Harmonics	Meets EN 61000-3 (harmonics and voltage fluctuations)	
Touch Current	1.2mA max @ 50/60Hz, 264V AC per UL 60950 test procedures (Sec. 5.0)	
Routine Factory Tests	Di-electric strength (hi-pot) to 2121V DC input- to-chassis and input-to-outputs; MegOhm to 500V output-to-chassis	

*Specifications subject to change without notice.

STANDARD MARKING AND LABELING

A 2"x1" [50.8x25.4mm] adhesive label is applied to the front panel (ref. TEES 1.4.3). As a minimum, this label is imprinted with JE model identification data including JE name, JE model designation, JE part number, the input/output ratings, a 4-digit (week/year) manufacturing date code, and manufacturing facility identification code. Application of any future authorized product safety certification marks, user specified part number or model description, or user required markings such as bar codes, revision codes, name, or logo is optional, but may require an enlarged or additional label. Please consult the factory for details.

CUSTOM CONFIGURATION CODE

-MXXXX: Indicates a Modified model, where XXXX is a factory assigned 4-digit number to identify a unique, user specified configuration. Such models may include special or non-standard features and/ or options, or be in a configuration differing sufficiently from the design of the approved similar standard model to require reevaluation of all or part of the design to ensure continuing compliance with all safety requirements. Please consult the factory for details.

STANDARD DOCUMENTATION

A Certificate of Conformance and a Test Certificate shall be included with each lot shipped. Unit serial numbers within the lot shall be listed on the certificates.

Following user acceptance of the production released configuration (Revision A), changes that affect the final (end) assembly revision shall not be incorporated unless and until the user has been notified and has submitted written approval for the change to JE engineering. This requirement applies to both JE and user requested design changes.

RoHS COMPLIANT

The TC206LS is fully compliant with the requirements of Directive 2002/95/EC Restrictions of Hazardous Substances (RoHS). RoHS compliant models are identified with the letter code "G" suffix added to the JE internal part number on the unit labels and related documents (sales orders, etc). All materials, processes, and packaging used in the assembly and shipping of RoHS versions comply. A Certificate of Compliance is available on request. Please contact the factory for more information.

PACKAGING AND SHIPPING

JE ships FOB Origin from the Anaheim, CA factory or our other subsidiary facilities.

Jasper Electronics



LIMITED WARRANTY POLICY

All Jasper Electronics (JE) standard model power supplies and products are guaranteed to be free of defects in workmanship and materials for a minimum of two (2) years from the date of original shipment, when operated within specification. Non-standard (custom) power supplies and products may be warranted on an individual basis. The unused portion of this warranty is fully transferable with the original equipment in which the power supply is installed. Please see our website for full warranty statement.

PDA2-LS MECHANICAL DRAWING







PDA2-LS OUTLINE DRAWING









INNOVATIVE SPECIALTY DC POWER SYSTEMS

Standard and Custom Power Supplies from 5W to 10KW

TRAFFIC CONTROL POWER SUPPLIES



- 70-400+ Watts / 120 and 220 VAC Models Available
- CALTRANS TEES, NYSDOT, CDOT, GDOT Compliant for 332, 334, 336, 342, 344, and 346 Series cabinets
- RoHS and NEMA Compliant
- Custom labeling and barcoding available
- Ruggedization against shock / vibration / humidity available

CUSTOM POWER DISTRIBUTION ASSEMBLIES (PDAs)



- Compliant with TEES 2020
- 1U smaller than the PDA2-LX and PDA3-LX
- User accessible slots as specified
- Custom labeling and barcoding available
- Ruggedization against shock / vibration / humidity available

COMPACT PCI



- AC or DC input, 175W 500W DC output, active PFC
- 3U x 8HP, 6U x 8HP sizes
- PICMG 2.11 compliant, UL/CSA, NEMKO/TUV/CE certified, ROHS compliant
- Ruggedization against shock/ vibration/ humidity optional

Primary Applications: Industrial Computing, Military, Satellite Comm, Test, Transportation, Telecom, Aerospace

SPECIALTY HOT-SWAPPABLE POWER SUPPLIES



- 200-1500W, Universal Input, 5-54VDC Output
- Hot Swap. N+1, 90+% Efficiency
- 1U Form Factors
- 30+ Variations for Various Applications Including Nuclear
- Ruggedization against shock/ vibration/ humidity optional

Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics

RACK POWER SYSTEMS



- 200W-1500W, 2-8 slots, single or mixed output voltages, up to 10KW total
- Single, dual, or individual unit AC or DC input
- Internally or externally redundant DC outputs
- Standard 19" and 23" size or user-specified configurations also available
- Ruggedization against shock/ vibration/ humidity optional

Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics

LOW NOISE CONVECTION / CONDUCTION COOLED POWER SUPPLIES



- 200W-500W, 90—264VAC full range input with 12-54 VDC Output
- Wide operating temperature range / high efficiency
- Small form factors
- Ruggedization against shock/ vibration/ humidity optional

Primary Applications: Medical Equipment, Military, IT, Sensitive Electronics

Jasper

Electronics

MEDICAL ADAPTERS



- 6W-250W, Efficiency levels V & VI
- Desktop, Wall-mount, and Interchangeable AC
 plug types
- Large selection of output connectors additional cable lengths available
- UL60601 (medical) approved adapters available
- Ruggedization against shock/ vibration/ humidity optional

CUSTOMS & MODIFIED STANDARDS



- 75W-2KW
- Single to 7 outputs
- Designed and built to custom or semi-custom specifications
- Ruggedization against shock/ vibration/ humidity optional
- Custom electrical specs, chassis, paint, labeling, connectors, interface all available

Primary Applications: Medical Equipment, Military, Test, Automotive, Computing, Audio, Sensitive Electronics



ASR ISO9001:2015

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